

ABSTRACT OF THE DISCLOSURE

Disclosed is a box-shaped facing-targets sputtering apparatus capable of forming, at low temperature, a compound thin film of high quality while causing minimal damage to an underlying layer. The box-shaped facing-targets sputtering apparatus includes a box-shaped facing-targets sputtering unit and a vacuum chamber, the sputtering unit including a rectangular parallelepiped frame having six faces, one of which serves as an opening face, and a pair of facing target units, each including a target and magnetic-field generation means formed of a permanent magnet which is provided so as to surround the target, which means generates a facing-mode magnetic field extending in a direction perpendicular to the surface of the target and a magnetron-mode magnetic field extending in a direction parallel to the target surface, in which the target units are provided on first opposing faces of the frame which are located adjacent to the opening face, and second opposing faces and the remaining one face of the frame are shutted, wherein the sputtering unit is provided on the vacuum chamber such that the opening face faces the vacuum chamber and a substrate on which a thin film is to be formed, the substrate being disposed in the vacuum chamber, which sputtering apparatus further includes, in a plasma confinement space, an auxiliary electrode which absorbs electrons, the plasma confinement space being provided in the interior of the sputtering unit.